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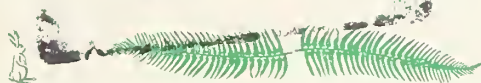
MANAGING YOUR WOODLAND

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HOW TO DO IT GUIDES

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PACIFIC NORTHWEST REGION—STATE AND PRIVATE FORESTRY

No. 1

PORTLAND, OREGON

May 1959

Revised June 1961

HARVESTING YOUR DOUGLAS-FIR FOR MAXIMUM INCOME

Trees are a crop. However, unlike most other crops, they cannot be harvested a few months after planting. It normally takes 20 to 30 years after an area is seeded or planted before the trees have a merchantable value. The trees increase in diameter and height each year at varying rates. When growing conditions are favorable, there is a rapid increase in size. When trees have to compete with each other for moisture or sunlight, growth is retarded.

The young trees grow rapidly until their branches meet and they start competing for sunlight. At about the same time their roots start to compete for moisture and soil nutrients. As a result of this competition, all of the trees grow at a slower rate. As the competition continues, the weaker trees are shaded and killed by the stronger or dominant trees. This causes an annual reduction in the number of trees until the stand reaches maturity. Even when of merchantable size, these dead trees are seldom harvested since there are only a few per acre each year and insects or disease destroy their value very quickly. The remaining trees have had their growth slowed by the competition so have taken many more years to reach commercial size.

A tree growing with limited competition on most Douglas-fir lands can increase 2 to 4 inches or more in diameter in 10 years. As long as this rate of growth continues, the tree is increasing in volume and value at a maximum rate and harvesting should be delayed. If growth slows down because of competition from other trees, it can be restored by cutting the competing trees and leaving more space for the remaining trees to grow.

Any thinning during the first twenty years will probably be unmerchantable but the selected trees remaining will be stimulated to reach commercial size sooner. After 20 years, the trees cut in thinnings are often of merchantable size and can be sold at a profit. Several such thinning operations are needed to maintain rapid growth of the crop trees. A final clear-cut harvest of the area should be made at the end of the established rotation when the annual growth becomes slower. Mature timber stands often suffer losses from insects, disease and other factors equal to or in excess of the annual growth. Such stands are not increasing much in net volume or in value and should be harvested to allow establishment of a new fast growing stand.



FOR FURTHER INFORMATION CONSULT YOUR LOCAL FORESTER





The main factors to consider for maximum production and income from a Douglas-fir forest are as follows:

1. Utilize all of the land to full capacity with a forest crop.
2. Maintain a good growth rate.
3. Utilize as much of the wood growth as possible.
4. Grow and sell quality products (peeler logs, poles, sawlogs).
5. Harvest mature products when the market is best for that particular product.

Care in felling trees to be harvested is important in the small amount of damage likely to the remaining trees and the minimum loss to the trees cut due to breakage.

Total values can often be increased by care in harvesting to avoid damage and consideration of defects when bucking the tree into logs. The volume and grade of a log can often be increased by cutting it 2 to 4 feet shorter to avoid a defect or limb cluster. Loss from crook can be reduced by cutting shorter logs. When cutting logs of varying length, keep the lengths within the range wanted by the mill.

The results of repeated thinnings at 4 to 5 year intervals from age 10 to approximately 60 years is shown in the following theoretical thinning schedule. Crop trees have been selected early so that each time the stand is thinned each crop tree is given some further release. As a result, each crop tree grows faster than normal and tree diameters and commercial volumes per acre increase.

Income from thinnings at 5-year intervals is greater as tree diameter increases.

Recovered values can often exceed those from sawlog production if some of the volume can be harvested as poles and piling.

Periodic thinnings are repeated until only the trees designated as crop trees are left.

At 63 years of age, as shown on the table, only selected crop trees remain. At this point, the owner has a choice of several procedures:

1. He can clear-cut the area and get his stumpage volume as shown. This would be unwise as trees at this age are usually growing at a rapid rate.
2. He can again thin the stand to promote growth of the remaining trees and prolong the harvest.
3. He can leave all of the trees for 10, 20 or more years to gain additional size and value.

Since we have no record of well managed stands thinned periodically for 60 years, we have developed this table on a theoretical basis to indicate the growth rates and volumes that may possibly be obtained. The diameters and volumes shown are based on an assumption that early growth is at the rate of 4 rings per inch, dropping to 5 rings per inch at 18 years of age and maintaining that rate of growth. Average tree diameters of the stand are used according to the method developed on pages 64 to 70 of Technical Bulletin #201 (Revised Oct. 1959) "The Yield of Douglas-fir in the Pacific Northwest".

THEORETICAL THINNING SCHEDULE FOR GROWING DOUGLAS-FIR STANDS

Computation of a theoretical thinning schedule calculated to maintain a rate of growth of 5 rings per inch on a maximum number of trees, starting from a 7x8 spacing (778 trees) and frequent thinnings favoring the 100 crop trees per acre. After 20 years of age, all trees from thinnings are harvested commercially.

(1)	(2)*	(3)*	(4)*	(5)*	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Age	Average DBH of Stand	Total Ht.	Volume Per Average Tree		Basal Area Per Average Tree	Number Trees Per Acre		Basal Area Per Acre (Col. 6x7) (Sq.Ft.) (Bd.Ft.)	Volume -- Scribner Rule		
			Cu. Ft. to Tip	Bd. Ft. to 8" Top		Before and After	Trees Cut		Before Thinning (5x7) (Bd.Ft.)	In Trees Cut (5x8) (Bd.Ft.)	In Trees Left (10-11) (Bd.Ft.)
(Years)	(Inch)	(Feet)	(Cu.Ft.)	(Bd.Ft.)	(Sq.Ft.)	(No.)	(No.)	(Sq.Ft.)	(Bd.Ft.)	(Bd.Ft.)	(Bd.Ft.)
10	2	22	.2	--	.0218	778	100	17.36	Some products may be cut from early thin-		
14	4	39	2.0	--	.0873	678	100	59.18	nings, such as Christmas trees, posts, etc.		
18	6	55	5.1	--	.1963	578	100	113.46	--		
23	8	69	10.9	11	.3491	478	100	166.87	--		
28	10	83	19.6	43	.5454	378	100	206.16	5,258	1,100	4,158
33	12	97	31.5	99	.7854	278	50	218.34	16,254	4,300	11,954
38	14	110	46.6	184	1.0690	228	40	243.73	27,522	4,950	22,572
43	16	123	65.0	296	1.3963	188	30	262.50	41,952	7,360	34,592
									55,648	8,880	46,768
48	18	135	87	429	1.7671	158	25	279.20	67,782	10,725	57,057
53	20	147	112	593	2.1817	133	20	290.17	78,869	11,860	67,009
58	22	157	142	779	2.6398	113	15	298.30	88,027	11,688	76,342
63	24	167	175	999	3.1416	98	12	307.87	97,902	11,988	85,914

*Columns 2, 3, 4 and 5 taken from "The Yield of Douglas-fir in the Pacific Northwest", Technical Bulletin #201, revised 10/49 (Page 68).

